SB608
P65
F5
no.25

1938

347

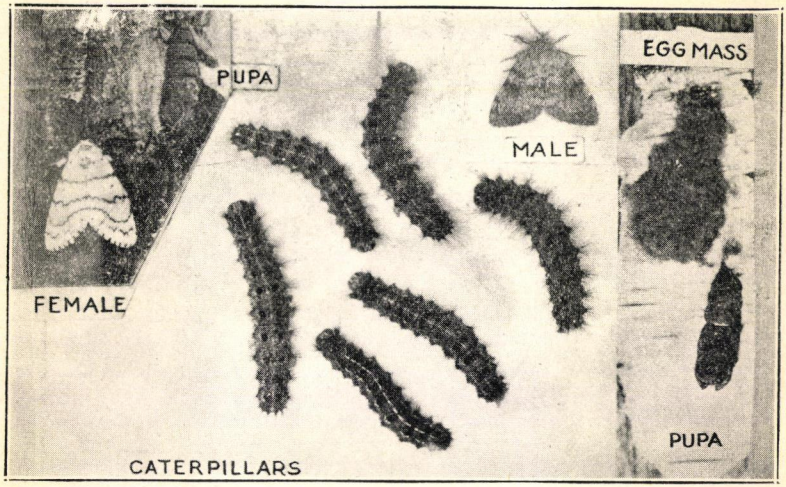
Number 25

Tree Pest Leaflets

THE GYPSY MOTH

Porthetria dispar (L.)

Prepared by A. F. BURGESS, Principal Entomologist, Division of Gypsy Moth and Brown-tail Moth Control, Bureau of Entomology and Plant Quarantine, United States Department of Agriculture.



Life stages of gypsy moth. All about two-thirds natural size.

Published for the Cooperators
by the
MASSACHUSETTS FOREST AND PARK ASSOCIATION
3 Joy Street, Boston

May 1938

Issued jointly through cooperation of the following agencies:

The State Foresters, State Departments of Agriculture, State Agricultural Experiment Stations, Extension Services, Forest Schools and Forest and Park Associations of New England and New York, and the Northeastern Forest Experiment Station, the Division of Forest Pathology, Bureau of Plant Industry and the Division of Forest Insect Investigations, Bureau of Entomology and Plant Quarantine of the United States Department of Agriculture.

Edited by the Committee on Educational Leaflets of the New England Section, Society of American Foresters.

THE GYPSY MOTH

Porthetria dispar (L.)

History and Distribution:—The gypsy moth, a European insect, was accidentally liberated in Medford, Mass., in 1869. After becoming acclimated to this country the moth multiplied rapidly and became a pest locally. It then spread over a large part of the New England States and developed into a serious threat to the tree growth of the continent. In 1923 a zone of control was established across the path of advance of the insect to prevent further dispersion. This barrier zone, which is more than 250 miles long and 25 to 30 miles in width, extends from the Canadian border to Long Island Sound and includes parts of Vermont, Massachusetts, Connecticut, and New York. Constant eradication work within the zone, assisted by a reduced infestation east of the zone, has been successful in halting the progress of the pest. Small infestations, probably caused by windspread, which are occasionally found west of the barrier zone, are promptly eradicated. Sizeable isolated infestations discovered in New Jersey in 1920 and in Pennsylvania in 1932 were considered to be of independent origin. Intensive eradication work was started at each of these infestations immediately following their discovery. No infestation has been found in New Jersey since 1935, and excellent progress has been made in the exterminative campaign being waged in Pennsylvania. The control and eradication work is performed cooperatively by the Bureau of Entomology and Plant Quarantine of the United States Department of Agriculture and the States concerned.

Host Trees:—Apple, speckled alder, gray and river birch, hawthorn, linden, oaks, poplars, and willows are most favored. Species distinctly less favored though eaten by the larvae in all instars include black, paper, and yellow birch, the cherries, chestnut, elm, black gum, hickories, hornbeam, larch, maples, and sassafras. Species not favored by the young larvae but favored by the larger larvae include beech, hemlock, southern white cedar, and the pines and spruces native to the eastern part of the United States. Those species of trees not at all favored as food include ash, balsam, butternut, black walnut, catalpa, red cedar, flowering dogwood, American holly, locust, sycamore, and tuliptree.

Injury:—The gypsy moth caterpillars inflict enormous damage on forest and fruit trees, and on shade and ornamental trees and shrubs by devouring the foliage from the time the leaves begin to appear in the spring until the latter part of June. The degree of the damage ranges from the partial defoli-

ation of a single tree to complete defoliation of all the trees over extensive areas, depending on the intensity and size of the infestation and the character of the growth. This defoliation retards the growth of the trees, induces malformation, and, if repeated, eventually causes the death of the trees.

Description:—The male moth is dark brown with black wing markings, and is a strong flyer. The female moth is nearly white with black wing markings, is much larger than the male, but is unable to fly. Each female deposits her eggs in a single cluster, averaging about 400 eggs per cluster, on trees, stones, rubbish, or any other available surface. The eggs are completely covered with buff colored hair from the body of the female moth, and the egg cluster resembles a mass of felt about the size of the first joint of the thumb. The full-grown caterpillar is about 1½ to 2½ inches long, hairy, with yellow markings on the head, and a sooty colored body with a row of five pairs of blue spots followed by a row of six pairs of red spots along the back. The pupae are chestnut brown and bear tufts of yellow hairs.

Life Cycle:—The moths appear about the middle of July and remain until the first of September; and the eggs, which are deposited during this time do not hatch until May. The uewly hatched caterpillars immediately begin to feed on the leaf buds and grow rapidly. Caterpillars that are to become male moths molt 5 times while those that are to become females undergo 6 molts. They pupate during the latter part of June and remain in this resting stage from 2 to 3 weeks before the moths emerge. There is but one generation a year.

Means of Spread:—Egg clusters deposited on trees, lumber, stone, and manufactured products may be carried long distances, either by commerce or by high waters, each cluster being a potential colony. Caterpillars may be transported on trains, automobiles, or other conveyances. The principal agent of distribution however, is the wind, which, under favorable conditions, may carry the small caterpillars several miles and scatter them over a wide area.

Natural Control:—Winter temperature is an important factor in gypsy moth abundance in New England, as all eggs not protected by snow or ice or otherwise sheltered are killed when the temperature drops to -25° F. or lower. Late spring frosts which severely damage the foliage often destroy large numbers of the small caterpillars. Long periods of rainy weather accompanied by low temperatures also kill great numbers of newly hatched caterpillars. The wilt disease often kills enormous numbers of caterpillars and pupae, particularly in heavy infestations.

The gypsy moth population is not reduced noticeably by native insects and birds, but it has been materially diminished in some sections by the establishment of parasites and other insect enemies introduced from Europe and Japan by the Bureau of Entomology and Plant Quarantine of the United States Department of Agriculture in cooperation with the State of Massachusetts.

Artificial Control:—Several control measures are used against the gypsy moth, the method chosen depending on localities and the degree of infestation.

As the egg clusters remain in the field for about 8 months, this stage is especially susceptible to control by applying to the clusters with a brush a penetrating liquid known as "gypsy moth creosote." The liquid is a low-grade

coal tar creosote impregnated with sufficient coal tar pitch to discolor the egg clusters.

Spraying the foliage with a lead arsenate solution during the 4 to 6 weeks when the caterpillars are present is an efficient control measure against the caterpillars. The most effective mixture is 5 pounds of lead arsenate to 100 gallons of water, with 20 fluid ounces of either fish oil or linseed oil added as a sticker.

Many caterpillars may be crushed at burlap bands which are tied around trees to provide an alluring shelter during hot, sunny days.

Bands of sticky tree-banding material, which is produced commercially, may be used on tree trunks to prevent the caterpillars from ascending the trees. The caterpillars congregate below the bands, and many of them die from starvation or the wilt disease, which often develops in the massed caterpillars.

Removal and destruction of infested trees and litter is usually necessary in controlling this insect, and this may be combined with the other methods already mentioned. In woodlands, selective removal of the species of trees most favored by the insect will reduce the infestation and improve the forest.

Spread of the insect by transportation is prevented by a strictly enforced Federal quarantine against the movement without inspection, to points outside of the infested areas, of all materials likely to harbor any stage of the gypsy moth.

REFERENCES

Burgess, A. F.,—The Gypsy Moth and the Brown-tail Moth. U. S. Dept. Agr. Farmers' Bull. 1623. 32 pp., illus. 1930.

Behre, C. E., Cline, A. C., and Baker, W. L.—Silvicultural Control of the Gypsy Moth. Mass. Forest and Park Assoc. Bull. 157. 16 pp., illus. 1936